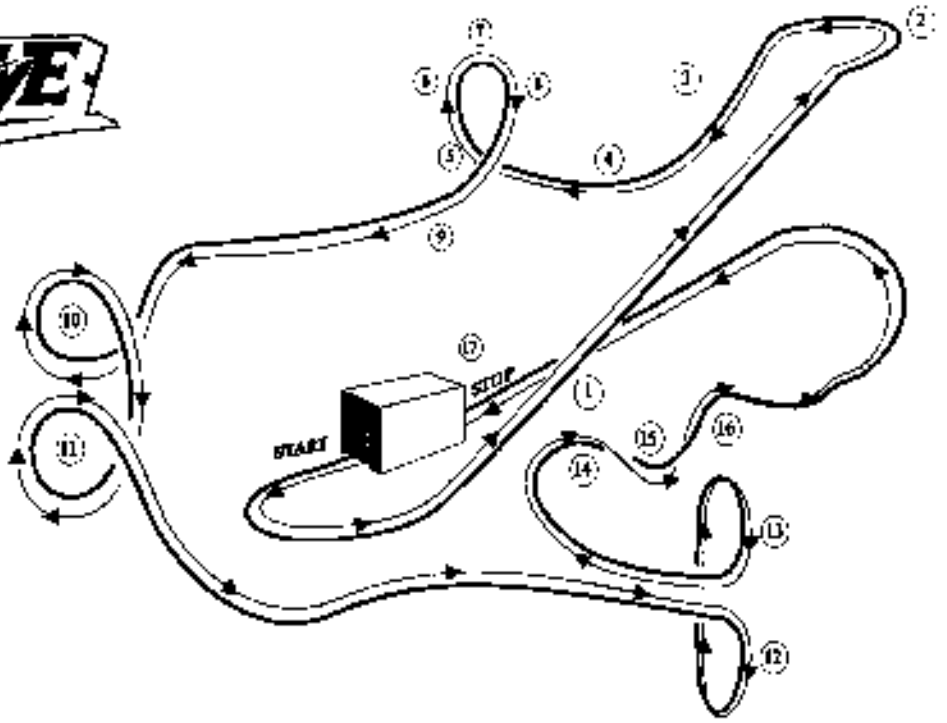

1. What is your speed at the bottom of the high rise? Please assume no friction. When calculating the speed at the bottom of the high rise, why don't we need to know the mass of the roller coaster and the individuals riding the roller coaster?

2. What would be your speed if you were to fall "freely" from the top to the bottom of the high rise? Does the "twist" in the initial drop affect the final speed at the bottom? Explain.

3. What would be your time of descent if you were to free fall from the top of the high rise to the bottom of the high rise? Compare this time to the actual time of descent. What could explain the difference?

4. How much work does the track do for one complete ride? Assume no friction.

5. What is your acceleration down the high rise incline? Express your answer as a fraction of "g".

6. Estimate the minimum horsepower required to haul the roller coaster and its contents up the high rise.

7. What is the centripetal acceleration at the top of the first vertical loop?

8. Where is your potential energy 1/4, 1/2, 3/4 of the maximum potential energy for the top of the high rise? Please calculate these potential energy Values (1/4, 1/2, 3/4 of potential energy Max) in joules.

9. Produce a graph of kinetic energy, potential energy, and total mechanical energy as a function of the height of the high rise.

10. As the Shock Wave travels around the first vertical loop, where is the velocity vector of the train perpendicular to the acceleration vector?

11. What keeps you in your seat as you ride around the first vertical loop?

12. Carefully explain what is meant by centripetal and centrifugal forces. Position yourself so you can get a close view of the first vertical loop of the Shock Wave. The fence near the bumper cars is a good location. As the Shock Wave enters the first vertical circle, describe the force on the Shock Wave due to the vertical loop and the force on the vertical loop due to the Shock Wave?